<u>REMARKS</u>

The Applicant respectfully requests further examination and consideration in view of the arguments set forth fully below. Prior to this Office Action, Claims 1, 3-6, 9-19, 22-28, 30-33, and 36-60 were pending in this application. Within the Office Action, Claims 1, 3-6, 9, 12-19, 22, 25-28, 30-33, 36, 39-44, 46-50, 52-56, and 58-60 are rejected, and Claims 10, 11, 23, 24, 37, 38, 45, 51, and 57 are objected to. Accordingly, Claims 1, 3-6, 9-19, 22-28, 30-33, and 36-60 are currently pending in this application.

<u>Rejections Under 35 U.S.C. § 103</u>

Within the Office Action, Claims 1, 3, 15, 16, 42, 43, 44, 46, 48, 49, 50, and 52 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,697,346 to Halton et al. (hereinafter "Halton '346") in view of U.S. Patent No. 6,621,803 to Halton et al. (hereinafter "Halton '803"). The Applicant respectfully traverses these rejections.

The present invention allocates a queue in a weighted fair queue to generate contention slots, where each contention slot is designated for either the request and grant mode or the contention mode. Idle end user nodes (EUNs) utilize a contention slot designated for contention mode to request access. All EUNs are grouped into virtual groups, and an upstream (from EUN to a hub) contention mode contention slot is announced to all EUNs within a given virtual group via a grant from the hub using a multicast addressing mode. If a collision occurs between two idle end user nodes requesting access using the contention slot designated for contention mode, two new contention slots designated for request and grant mode are generated, and the newly generated slots are placed in the weighted fair queue. The previously idle EUNs are now considered active EUNs, where each active EUN utilizes a request and grant mode contention slot.

Both contention mode and request and grant mode are well known in the art. In the contention mode, a hub broadcast which EUNs are eligible to contend for a particular contention time slot. Each contending EUN will then answer the broadcast if that particular EUN wishes to transmit. The request and grant mode functions oppositely of the contention mode. In the request and grant mode, each individual EUN that wishes to transmit will unicast a request for a time slot from the Hub. The Hub will then broadcast a time slot grant signal to every EUN. When this occurs, each individual EUN will receive the signal and will recognize whether it, or

another EUN is receiving a time slot grant. These grants will assign EUNs to time slots based on bandwidth availability (Specification, page 2, lines 10-21)..

Within the present invention, the rate of generating contention slots is automatically adjusted. When the network is heavily loaded and a number of active EUNs are requesting bandwidth from the weighted fair queue, the contention slot designated for contention mode will occupy a small percentage of the total requests to the weighted fair queue. As the network becomes lightly loaded, the number of EUNs requesting bandwidth from the weighted fair queue decreases, thereby reducing the number of contention slots designated for request and grant mode.

The number of contention slots designated for request and grant mode increases and decreases according to the number of EUN access requests. However, the number of contention slots designated for contention mode remains a fixed, constant number. In the preferred case, the number of contention mode contention slots is one. In this case, the number of request and grant mode contention slots will vary based on the number of access requests, but the number of contention mode contention slots remains fixed at one.

Halton '346 teaches a random access time window utilized by mobile stations attempting to access a base station. The random access time window is divided into random access slots. The random access slots are designated as either contention based or reservation based. Contention based slots are grouped as a first section 2 (Halton '346, Figure 2 and 3) and the reservation based slots are grouped as a second section 3. The random access slots are dynamically allocated as either reservation based or contention based. A partition point is used to allocate the random access slots into either the first section 2 or the second section 3.

Within the Office Action, it is stated that Halton '346 teaches the use of request and grant based contention slots. The Applicant respectfully disagrees with this conclusion.

Halton '346 teaches that the contention based slots are used for initial access by the mobile stations. This initial access includes a request to utilize the reservation based slots and the number of reservation based slots required (Halton '346, col. 7, lines 41-45). In effect, the initial request is a request by the mobile station for channel reservations to transfer data (Halton '346, col. 7, lines 49-50). The reservation based slots are used to transfer data. The reservation based slots are only utilized by the mobile stations according to reservations made during the initial request. The initial request reserves a specific number of reservation slots to transfer data. Once the reserved reservation based slots are utilized, those reservation based slots are released. If the mobile station wants to send additional data, another reservation request must be made using the

contention based slots as described above (Halton '346, col. 11, lines 1-15). Halton '346 does not teach that a reservation request, also referred to as a request for access, can be made using the reservation based slots. Halton '346 teaches that the reservation based slots are utilized to transfer data, not to make access requests (Halton '346, col. 15, lines 28-31). In contrast, the present invention teaches a request and grant mode contention slot in which an active end user requests and is granted dedicated access to a particular slot. Utilization of request and grant mode is well known in the art as described above. The reservation based slots of Halton '346 are not the same as a request and grant mode contention slot as claimed in the present invention.

Halton '803 is directed to a device that transmits and receives random access data in a code division multiple access system. As stated in the Office Action, Halton '803 is cited for prioritizing a first number of contention slots (reservation mode) and a second number of contention slots (contention mode). Halton '803 is not cited for allocating contention slots according to a request and grant mode.

The independent Claim 1 is directed to a method of integrating a scheduling algorithm in a wireless network shared by a plurality of users. The method includes generating one or more contention slots, allocating a first number of contention slots according to a request and grant mode, wherein the first number is determined by a number of user access requests, allocating a second number of contention slots according to a contention mode, prioritizing the first number of contention slots and the second number of contention slots, and dynamically adjusting the first number of contention slots according to a change in the number of users requesting access. As discussed above, neither Halton '346 nor Halton '803 teaches the use of a request and grant mode. For at least these reasons, the independent Claim 1 is allowable over Halton '346 in view of Halton '803.

Claims 3, 42, 43, 44, and 46 are dependent on the independent Claim 1. As discussed above, Claim 1 is allowable over the teachings of Halton '346 and Halton '803. Accordingly, Claims 3, 42, 43, 44, and 46 are each also allowable as being dependent upon an allowable base claim.

Within the Office Action, it is stated that Halton '346 teaches a buffer space wherein contention slots and reservation slots are set in thresholds, and that this teaches the limitation of the dependent Claim 42, which claims the second number of contention slots is a fixed, predetermined number. The Applicants respectfully disagree with this conclusion. The second number of contention slots are those contention slots designated for contention mode. As discussed above, the present invention teaches that the number of request and grant mode

contention slots will vary based on the number of access requests, but the number of contention mode contention slots remains fixed. Halton clearly teaches in regards to Figures 2 and 3, that the partition point is moved based on the number of user access requests, and that movement of the partition point increases or decreases the number of random access slots available in section 2 (contention based slots). Since the number of contention based slots varies based on movement of the partition point, the number of contention based slots cannot remain fixed, as claimed in the dependent claim 42.

Thresholds, as described in Halton '346, act as triggers in regard to random access attempt failures. These triggers act to increase or decrease the number of random access slots allocated to the contention based slots. For example, in the case where the total number of failed contention based random access attempts reaches a predetermined contention threshold, the number of contention based random access slots is increased, or in other words the partition point is moved (Halton '346, col. 13, lines 62-67). Clearly, Halton '346 does not teach that the number of contention based slots remains fixed.

The independent Claim 15 is directed to an apparatus for integrating a scheduling algorithm in a wireless network shared by a plurality of users. The apparatus includes means for generating one or more contention slots, means for allocating a first number of contention slots according to a request and grant mode, wherein the first number is determined by a number of user access requests, means for allocating a second number of contention slots according to a contention mode, means for prioritizing the first number of contention slots and the second number of contention slots, and means for dynamically adjusting the first number of contention slots according to a change in the number of users requesting access. As discussed above, neither Halton '346 nor Halton '803 teaches the use of a request and grant mode. For at least these reasons, the independent Claim 15 is allowable over Halton '346 in view of Halton '803.

Claims 16, 48, 49, 50, and 52 are dependent on the independent Claim 15. As stated above, Claim 15 is in a condition for allowance. Accordingly, Claims 16, 48, 49, 50, and 52 are each also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 28, 30, 36, 39, 40, 41, 54, 55, 56, 58, and 60 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Halton '346 in view of Halton '803, and further in view of U.S. Patent No. 6,366,761 to Montpetit et al. (hereinafter "Montpetit"). The Applicant respectfully traverses these rejections.

Within the Office Action, Halton '803 is cited for prioritizing a first number of contention slots and a second number of contention slots, and Montpetit is cited for a user node requesting a portion of bandwidth and for a hub transmitting/receiving requests and assigning the portion of the requested bandwidth. Neither Halton '803 nor Montpetit are cited for utilizing a request and grant mode. As discussed above, Halton '346 also does not teach the use of a request and grant mode. As such, neither Halton '346, Halton '803, Montpetit, nor their combination teach the use of a request and grant mode.

The independent Claim 28 is directed to an apparatus for integrating a scheduling algorithm in a wireless network channel shared by a plurality of users. The apparatus includes a hub for transmitting and receiving wireless network signals such that the hub may receive requests and assign portions of a communication bandwidth, a plurality of end user nodes for transmitting and receiving wireless network signals such that a plurality of users may request or be granted a portion of the communication bandwidth, and a weighted fair queue for utilizing an adaptive contention scheduling scheme to generate one or more contention slots, to allocate a first number of contention slots according to a request and grant mode, wherein the first number is determined by a number of user access requests, to allocate a second number of contention slots according to a contention mode, to prioritize the first number of contention slots and the second number of contention slots, and to dynamically adjusting the first number of contention slots according to a change in the number of active users requesting access. As discussed above, neither Halton '346, Halton '803, Montpetit, nor their combination teach the use of a request and grant mode. For at least these reasons, the independent Claim 28 is allowable over Halton '346, Halton '803, Montpetit, and their combination.

Claims 30, 36, 39, 40, 41, 54, 55, 56, 58, and 60 are dependent on independent Claim 28. As stated above, Claim 28 is in a condition for allowance. Accordingly, Claims 30, 36, 39, 40, 41, 54, 55, 56, 58, and 60 are also in a condition for allowance.

Within the Office Action, Claims 31-33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Halton '346 in view of Halton '803, in view of Montpetit, and further in view of U.S. Patent No. 6,381,228 to Prieto, Jr. et al. (hereinafter "Prieto"). The Applicant respectfully traverses these rejections.

Claims 31-33 are dependent on independent Claim 28. As stated above, Claim 28 is in a condition for allowance. Accordingly, Claims 31-33 are each also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 4-6, 9, 12-14, 17-19, 22, and 25-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Halton '346, in view of Halton '803, and further in view of Prieto. The Applicant respectfully traverses these rejections.

Claims 4-6, 9, and 12-14 are dependent on independent Claim 1. Claims 17-19, 22, and 25-27 are dependent on independent Claim 15. As stated above, Claims 1 and 15 are in a condition for allowance. Accordingly, Claims 4-6, 9, 12-14, 17-19, 22, and 25-27 are each also allowable as being dependent upon an allowable base claim.
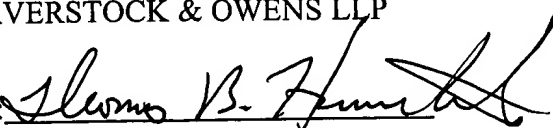
Within the Office Action, Claims 47, 53, and 59 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Halton '346. The Applicant respectfully traverses these rejections.

Claim 47 is dependent on independent Claim 1. Claim 53 is dependent on independent Claim 15. Claim 59 is dependent on independent Claim 28. As stated above, Claims 1, 15, and 28 are in a condition for allowance. Accordingly, Claims 47, 53, and 59 are each also allowable as being dependent upon an allowable base claim.

Within the Office Action, it is stated that Claims 10, 11, 23, 24, 37, 38, 45, 51, and 57 are objected to as being dependent upon a rejected base claim, but would be allowable of rewritten in independent form including all the limitations of the base claim and any intervening claims.

For the reasons given above, Applicant respectfully submits that the claims are in a condition for allowance, and allowance at an early date would be appreciated. Should the Examiner have any questions or comments, the Examiner is encouraged to call the undersigned at (408) 530-9700 to discuss the same so that any outstanding issues can be expeditiously resolved.

Respectfully submitted,

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Dated: 7-26-04

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CERTIFICATE OF MAILING (37 CFR§ 1.8(a))

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the U.S. Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the: Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450

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